maggot rests in the sore, and presently assumes a more pear-shaped form.

When about one-third grown, a great change takes place in the structure of the creature, which, while it was forcing its passage, was "little more than a bag of fluid, with a large proportion of the space *occupied by breathing-tubes*." At this stage, however, "the hard tips necessary, or at least serviceable for forcing a passage up the hide, are no longer needed, and they are exchanged for a broad form of spiracle, and the internal organs become suited to provide material for the development of the fly, which will presently form in the dry husk of the maggot, which serves as the chrysalis-case."

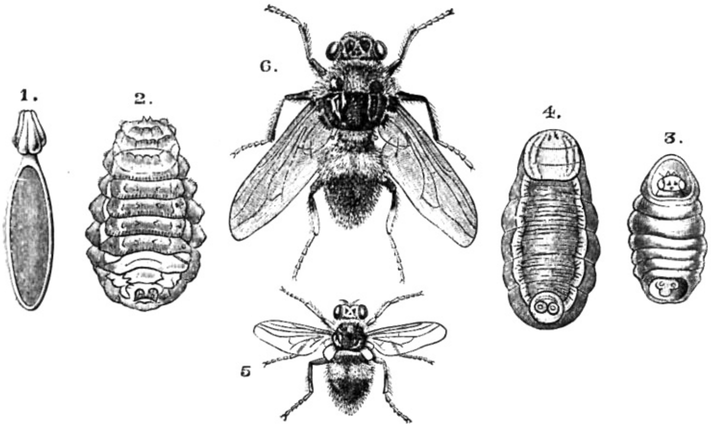

Fig. 1.—*Hypoderma bovis.* 1, egg; 2, maggot; 3 and 4, chrysalis-case; 5 and 6, fly; 3 and 5 natural size, after Bruey Clark; the other figures, after Brauer, and all magnified.

The further development of the maggot is so well known that we scarcely need trace its course until it reaches its final shape of a hairy two-winged fly, not very unlike a small humble-bee in general appearance, nor need we go into the elaborate accounts of the enormous loss which is frequently caused by it to all persons interested in living or dead cattle. The fly appears to be found in most parts of the world, but is a much greater pest in some countries than in others; and it is worthy of notice that, while goats appear to suffer from the warble as much or more than cattle, horses seem never to be attacked by it.

Miss Ormerod, however, gives several easy, harmless, and efficacious methods by which the mischief may be abated or removed; and the fly appears to be sluggish, and not to stray far from where it lived as a maggot, for after a few years' careful destruction of the maggots, the pest seems to disappear, without the farm being liable to fresh incursions from surrounding farms where similar precautions have not been taken to exterminate the maggots. Miss Ormerod has evidently done her best to show the farmers how they may best exterminate the pest; and if they do not avail themselves of the information which she has been at so much trouble to collect and to disseminate, it will not be her fault. The accompanying illustration is from her useful pamphlet.

W. F. Kirby.

FERDINAND DE LESSEPS.

THE death of M. de Lesseps, on Friday last, removes from the world one of its more prominent men. To say that it was his indefatigable energy which brought to a successful termination the scheme to pierce the Isthmus of Suez, is but to repeat what is known to every schoolboy. With the affairs that during the last two years have obscured his fame to the political eye we have nothing to do. The work which earned for him the title of "Le Grand Français" is sufficient to command the admiration of every man of science. The appreciative obituary notice in the *Times*, running into nearly four columns, deals largely with de Lesseps' diplomatic career, but this does not concern us. We are indebted to the notice, however, for some of the following particulars of interest to our readers.

Ferdinand de Lesseps was born at Versailles, November 19, 1805. His early public life was spent in the diplomatic service, for which he manifested the same predilections as his ancestors. But so far back as 1841, the project for cutting through the Isthmus of Suez had occurred to him. It was not until 1854, however, that he first revealed the scheme that will be most lastingly associated with his name. Two years later, Said Pasha, the Viceroy of Egypt, granted him a formal letter of concession. In the same year de Lesseps published a clear and definite exposition of his views in his pamphlet "Percement de l'Isthme de Suez. Exposé et documents officiels." Many eminent engineers questioned the practicability of the scheme; nevertheless a capital of two millions of francs was subscribed, and in 1859 the works were commenced.

Difficulties and disputes of a most serious character cropped up from time to time, but they were overcome, with the result that a canal, having sufficient water to admit of the passage of steamboats, was opened on August 15, 1865. The channel was widened and deepened by special machinery, and in March, 1867, small ships were able to make use of the Canal. The waters of the Mediterranean mingled with those of the Red Sea in the Bitter Lakes on August 15, 1869, and the event was commemorated by grand *fêtes* at Suez. On November 20 following, the Canal was formally opened at Port Said amid a series of brilliant festivities. The Canal is about 100 miles long, with a bottom width of upwards of 200 feet, and a depth of 28 or 29 feet.

Honours poured in upon M. de Lesseps after the successful opening of the Canal. In February, 1870, the Geographical Society of Paris awarded him the Empress's new prize of 10,000 francs. He gave it as a contribution to the Society's projected expedition to Equatorial Africa. He was appointed to the rank of Grand Cross of the Legion of Honour, and received the cordon of the Italian Order of St. Maurice. The honorary freedom of the City of London was presented to him, and Queen Victoria created him an honorary Knight Grand Commander of the Order of the Star of India. In July, 1873, the Paris Academy of Sciences elected M. de Lesseps a member, in the place of the late M. de Verneuil. In 1875 he published his "Lettres, Journal, et Documents pour servir à l'Histoire du Canal de Suez." For this work the French Academy awarded to him the Marcelin Guérin prize of 5000 francs. In June, 1881, he was elected President of the French Geographical Society, in the place of Admiral de la Roncière-le-Noury. The Broad Riband of the Persian Order of the Lion and the Sun was presented to him in 1883.

M. de Lesseps promoted the project of the Corinth Canal, and made a journey in Algeria and Tunis to study the scheme of Commandant Rondaire for the creation of an inland sea in Africa—a scheme of which he formed a favourable opinion. Gradually, however, he became wholly absorbed in the undertaking which was to prove his ruin—the Panama Canal. All the world knows how this ended. After the humiliating drama had been played out at the beginning of last year, the central figure sunk

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into a state of stupor, and in this condition—almost oblivious of everything that went on around him—he remained until he passed into the silence of death.

But let us forget these events. However dark they may seem to be, they cannot hide from us the wonderful applications of science we owe to Lesseps.

We learn from the *Times* that Mdme. de Lesseps has received many messages of condolence. The Emperor of Germany telegraphed to her, "All intellectual and scientific people mourn over the tomb of one of the greatest minds and of a genius which embraced the universe." Lord Dufferin has conveyed the sincere grief of the Prince of Wales, as also the sympathy of Lord Kimberley. It is understood that a committee of the Suez Canal Board is to propose to the company that a statue be erected to M. de Lesseps at the expense of the company, and that the city of Paris is to be asked to grant a site in one of the public squares.

These expressions show the high regard in which de Lesseps was held. A still more striking testimony is afforded by the fact that the Paris Academy of Sciences adjourned on Monday in sign of mourning, when the president, M. Lœwy, is reported to have said: "Many storms had latterly broken over the head of the illustrious veteran. It is, perhaps, not to be too much regretted that his declining strength had for several years made him almost a stranger to the melancholy affairs of this world. His name will for ever be linked with a grand work, the success of which is due entirely to his glorious efforts, and will be a memorable date in the history of civilisation."

Scientific posterity will remember the Academy's act of respect to de Lesseps, and M. Lœwy's words of tribute to his colleague's memory.

NOTES.

We are glad to see the report that M. Pasteur, who has been poorly for some little time, is improving in health.

Prof. G. Lewitzky, the Director of Charcow Observatory, has been appointed Director of Dorpat Observatory, in succession to the late Prof. L. Schwarz. Dr. L. Struve goes to fill Prof. Lewitzky's place at Charcow.

The Academy of Sciences of Berlin has granted a subsidy of 1200 marks to Dr. P. Kuckuck, to aid him in the investigation of the alga-flora of Heligoland.

We learn from the *Botanisches Centralblatt*, that Herr W. Siehe, of Berlin, has undertaken a botanical exploration of the almost unknown region of Cilicia Trachæa.

Considerable changes have recently been made in the scientific department of Smith College, U.S.A. The botanical department has been reorganised, and Dr. W. F. Ganong appointed professor. Miss Grace D. Chester, formerly instructor in botany, has been appointed instructor in cryptogamic botany.

Our correspondent at Cambridge has sent us the following notes:—The Council of the Senate have appointed Dr. R. D. Roberts to be a governor of the Royal Holloway College, Egham. Dr. H. H. Tooth, of St. John's College, has been appointed an additional examiner in medicine. The Walsingham Medal for biological research has been awarded to H. Burkill, assistant curator of the Herbarium. The following awards for Natural Science have been made at St. John's College: G. S. West, Royal College of Science, London, Foundation Scholarship of £80 a year; E. F. Hudson, Dulwich College, and T. F. R. McDonnell, St. Paul's School, Minor Scholarships of £50 a year; A. C. Ingram, Felsted School, Exhibition of £30.

A Société des Amis des Explorateurs francais has recently been formed at Paris. Its object is to collect and administer funds for the purpose of aiding travellers, particularly in their return, and to contribute to the progress of geography by the publication of the results of explorations, and other contributions to geographical science. The Society is in connection with the Paris Geographical Society.

We thought it would come. The anti-vaccinationists, anti-vivisectionists, and kindred souls have, if only for the sake of consistency, protested against the new treatment for diphtheria. At the ordinary fortnightly meeting of the Metropolitan Asylums Board, on Saturday last, a deputation, headed by Lord Coleridge, waited upon the Board to present a memorial against experiments being carried out in the hospitals in the Metropolitan Asylums district in the use of the anti-toxin cure for diphtheria. The Royal College of Physicians had offered to supply serum for the treatment of diphtheric patients in the Board's hospitals, and the General Purposes Committee advised the acceptance of it, but the deputation wished to stop the action altogether. By arguments that have been used over and over again, it was urged that the experiments led to injurious effects, and were of doubtful utility. Therefore, the deputation submitted, "public money ought not to be devoted to experiments in physiology." The Board, however, thought differently, for the report of the Committee was adopted.

Prof. W. C. McIntosh writes on the artificial hatching of marine food-fishes in *Science Progress* for December. In the course of his article, he pleads for increased funds to carry on experiments on a larger scale than is at present possible at Dunbar. The sum of £3000 per annum is granted to the Scottish Fishery Board for scientific investigations, but really only £1800 a year is available for research. "This income has to bear the salaries of the staff, experiments in fish-, lobster-, and mussel culture, the cost of apparatus, the marine laboratory at St. Andrews, the hatchery for marine fishes, with its small laboratory at Dunbar, and the carrying out of other scientific fishery work." Leaving England out of consideration, compare this with what is done on the other side of the Atlantic. "The United States spends annually £70,000 on fish-culture and scientific investigations, and employs two large steamers and a sailing vessel exclusively for the work. Besides this large sum, the Fish Commissioners of the various States also disburse considerably on the development of their fisheries. Canada, again, expends £100,000 yearly on her fisheries, of which a sum of about £10,000 is devoted to fish culture."

It was pointed out by Lord Rayleigh in these columns in 1883 (vol. 27, p. 535), that whenever a bird pursues its course for some time without moving its wings, we must conclude either (1) that the course is not horizontal, (2) that the wind is not horizontal, or (3) that the wind is not uniform. Prof. S. P. Langley's recently published memoir on the internal work of the wind shows that the condition represented by the third cause, which Lord Rayleigh believed must sometimes operate, always exists. The investigations described in the memoir distinctly prove that the wind is never a homogeneous current, but consists of a continued series of rapid pulsations varying indefinitely in amplitude and period. These pulsations undoubtedly help a bird to maintain its flight without working its wings or expending energy. This may be accomplished by a succession of ascents and descents; the ascents being made during the wind-gusts, and the descents during the lulls. Prof. George E. Curtis, of Washington, has lately investigated mathematically whether the third case of Lord Rayleigh's analysis is the one actually employed by a bird in soaring; that is to say, he has tested whether the pulsations of the wind,

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